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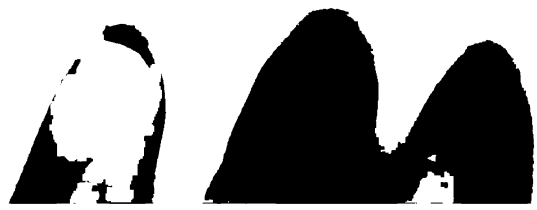


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CUTANEOUS TUBERCULOSIS.

Its Clinical Aspects and Etiological Relations.

BY JAMES C. WHITE, M.D.

Its Pathology.

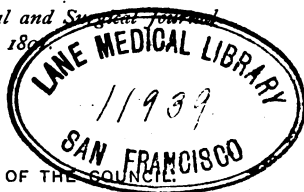
BY JOHN T. BOWEN, M.D.

Its Treatment.

BY GEORGE HENRY FOX, M.D.

Papers read at the Meeting of the American Dermatological Association at Washington, September 23, 1891.

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CLINICAL ASPECTS AND ETIOLOGICAL RELATIONS OF CUTANEOUS TUBERCULOSIS.¹

BY JAMES C. WHITE, M.D.,
Professor of Dermatology in Harvard University.

THERE is no disease within the special province of this Association which so much demands its earnest consideration as this, which has been selected for formal discussion to-day; for not only is tuberculosis of the vital tissues one of the most fatal and widespread destroyers of man, and in its cutaneous forms the source of frightful disfigurement, but great confusion exists with regard to the nature and mutual relations of some of its manifestations. The diversity of opinion which exists in the profession throughout the civilized world upon this point, has been made prominently manifest in the innumerable discussions and reports upon the action of Koch's remedy, which have been published during the past year. Such a universal and synchronous census of prevalent professional views upon any subject in medical pathology is unparalleled in history. If this cyclonic experimentation in therapeutics, fanned into a popular craze by the public press, and conducted to a lamentable and almost ridiculous end by the over-enthusiasm of its medical supporters, who in many instances knew as little of the external phases of the disease they were treating as they did of the remedy they were employing, shall result in no more immediate good than the creation of a proper interest in the study of the manifold manifestations of cutaneous tuberculosis, it will not have vexed the world in vain.

¹ Read at the meeting of the American Dermatological Association at Washington, September 23, 1891, introductory to the discussion upon Cutaneous Tuberculosis.

It is my function, as I interpret the instructions of the Council, to place the subject in its clinical and etiological relations before you in as simple a form as possible for discussion. Before this body it will be unnecessary more than briefly to indicate those well-recognized conditions of the skin, which have been hitherto assigned a more or less individual or independent position in cutaneous pathology among dermatologists, and which, with certain other less clearly defined conditions, it will be my object to show, are only progressive phases or clinical forms of a single affection.

I. — LUPUS VULGARIS.

I may be pardoned if I attempt to define before you the meaning of this term, as ordinarily used, by the briefest sketch of the lesions which characterize its course. The vast and needless number of specific terms which have been invented to express each particular phase of development or involution and every clinical form shows the great diversity of these manifestations. Several distinct types of its primary stages are recognized. The formation of apparent macules varying in size from a point to a pea, or larger areas of irregular outline, neither of which are elevated above the general surface, but are felt to represent infiltrations of the cutaneous tissues of varying depths — *L. maculosus, planus*. Papules, tubercles, nodules, or much larger areas elevated above the surrounding skin to the extent of a line to a half-inch. Like the former lesions these are found to extend more or less deeply into the skin, and exhibit the same boggy, yielding consistence when pressed upon with any blunt pointed instrument. These constitute *L. tuberculosus, nodosus, elevatus, tumidus, non-exedens, non-ulcerosus*. A more minute description of these ordinary early lesions, included under the common term lupoma, would be wholly superfluous.

Some modifications of these forms occur through progressive changes in the surrounding cutaneous tissues. Thus we may have an accompanying lymphangitis, persistent œdema, teleangiectasis, great general thickening or pachydermia, with papillary hypertrophy of the affected regions, *L. œdematosus*, *hypertrophicus*, *papillosus*, *elephantiasicus*, etc.

All these cutaneous changes constitute the various manifestations in its periods of progressive development or evolution.

Lupus undergoes involution or retrogression by interstitial resorption, fibrous degeneration, and ulceration. The earliest indication of the first named process is a change in the epidermal covering of the primary lesions in the form of scales in varying amount, *L. exfoliatus*, *psoriasicus*. Then follow a shrinking and depression of the elevations, and the slow formation of a smooth scar, an atrophic process. The fibrous forms of metamorphosis are divided by Vidal and Leloir into a so-called *L. sclereux*, which is never total, and is regarded by them as a slowly progressive form of development which remains virulent, containing bacilli and yielding positive results on inoculation, and *L. sclerosus*, *fibrosus*, a retrogressive change, no longer virulent, and not to be confounded with the scar formation which follows ulcerative forms.

Ulceration takes place in lupus tissue in a variety of forms, *L. exedens*, *ulcerosus*, which, according to the rapidity or penetration of the process, has received other designations — *superficialis*, *serpiginosus*, *profundus*, *vorax*, *phagadenicus*. The determining causes of this secondary process are not clearly understood. It is most probably not the result of the action of the tubercle bacillus, but of the accidental introduction into tissues already impressed by the former of suppuration-producing cocci.

The outcome of this destructive process is the eventual formation of true cicatricial tissue, and the development during its course of a variety of transitory conditions: crusting stages are *L. crustosus*, *rupoides*; excessive or exuberant granulation is *L. fungoides*, *vegetans*. Finally, the cicatrix is established, capable itself further of hypertrophy, *L. keloides*, and of presenting every possible appearance in its permanent state, according to the seat, treatment, etc.

These are the cutaneous changes which constitute the conditions ordinarily comprised under the term lupus. With so many elements of expression at command, it is evident that with its chronic course and associated dermatoses of occasional occurrence, dermatitis, erysipelas, etc., it is capable of exhibiting very great variety of appearances in individual cases.

II. — TUBERCULOSIS VERRUCOSA, VERRUCA NECROGENICA.

Verruca necrogenica, or anatomical tubercle, had long been recognized as a chronic, inflammatory, wart-like tubercle, affecting primarily the fingers of persons working in dissecting and autopsy rooms, ward-tenders, and butchers. In the last revision of our system of classification, in 1884, it was placed under "hypertrophies of the epidermal and papillary layers," next to ordinary verruca. Besnier and Vidal were the first to call attention to its occurrence upon persons making autopsies of subjects dying of consumption, and its resemblance to some forms of lupus. In 1884, bacilli were discovered in its tissues. In 1885 they were also found in several instances in the tubercles which had probably been produced by tuberculous inoculation, and in the inflamed axillary glands connected therewith. Early in 1886, Riehl and Paltauf published their article on "Tuberculosis Verrucosa Cutis," in

which the clinical and anatomical features of this now well-recognized form were described, and its probable identity with the more restricted anatomical tubercle established. The presence of the tubercle bacillus in the lesions of all clinical varieties was also demonstrated. Since then its peculiar and multiform features have become familiar to dermatologists everywhere, as its occurrence is found to be by no means rare, and but few fail to regard it as a phase of cutaneous tuberculosis. It may fairly, I think, be accepted as the ordinary form of manifestation in the cutaneous tissues of the inoculation of the same with tuberculous matter, whether derived from the cadaver of man or other animal, or by contact with infective material from living subjects. There is a considerable variation in the character of the lesions, from the primary and small nodule of more or less inflammatory type with its subsequent wart-like papillary hypertrophy, to the more extensive areas of deeper infiltration and greater prominence, characterized by well-marked verrucous transformations of some parts of its surface, by isolated or grouped, dull or purplish-red tubercles or nodules in others, and by depressed cicatricial changes in the central or other portions. Areas thus affected may be an inch, or even several inches in diameter, and may present various combinations of the above lesions. The papillomatous features may be wholly absent. When the plaques are multiple, and this condition is by no means infrequent upon the hands, we have opportunity of seeing how varied may be the expression of the disease even upon the same individual. The amount of inflammation incident to the developmental stages is variable also, manifesting itself in zones of surrounding dermatitis, or in the formation of superficial or deeper foci of suppuration within the diseased tissues. It rarely undergoes ulceration. But I need not more particularly

describe a condition with which you are all familiar, and concerning which several members of this Association have recently published communications. Among them Dr. Morrow's case is especially noteworthy, as occurring upon the face and presenting so exceptional a form of papillomatous lesion.

III. — TUBERCULOSIS CUTIS.

This title was applied, before its true and more comprehensive significance had become so generally accepted by dermatologists, to certain rare forms of disease, which must be here mentioned. In nearly all text-books and general treatises on skin diseases, even those most recently published, one finds the same definition, a brief transcript in fact of the description of certain ulcers observed by Jarisch, Chiari, Kaposi, and others, occurring about the orifices of patients in advanced stages of consumption, upon the lips, about the anus and vulva, and extending to the adjoining mucous membrane. These ulcers were discreet and shallow, had eroded, slightly infiltrated, irregular edges, and presented a reddish-yellow, granulating surface. Miliary tubercles were found associated with their extension within the buccal cavity, and in one instance within the true cutaneous tissues surrounding the ulcer. There is no apparent reason for regarding these classic cases as otherwise than exceptional forms of local auto-inoculation, assuming a rapidly ulcerative state from the generally depraved condition of the patients' tissues. There is certainly nothing in them to warrant the establishment of a special class on their account.

Under the title *dermatitis tuberculosa acuta*, or general miliary tuberculosis, Heller has described the case of a child in which there was an outbreak of macules, papules, vesicles, and bullæ over the whole

surface, subsequent to the development of caseous glands adherent to the right innominate vein. Bacilli were found in the contents of the vesicles, and in sections of the affected tissues.

Under the term *tuberculose pustulo-ulcereuse* Dr. Gaucher, of Paris, described at the last meeting of the International Congress of Dermatology an affection occurring in young children, characterized by impetiginous pustules, superficial in their early stage, but terminating in deep ulcerations, circular in shape, and covered with crusts. Inoculation of the pus from these lesions upon animals produced mild peritoneal tuberculosis. He regarded it as identical with some of the cases described by older writers as *impetigo rodens*. The process was of benignant type.

IV. — SCROFULODERMA.

This is a term most commonly applied to the progressive changes which take place in the skin covering so-called scrofulous glands in the neck. The primary seat of the process is generally either in the subcutaneous fibrous tissue, in the lymph glands themselves, or in the periglandular structures. Briefly described there is first noticed a firm, circumscribed infiltration beneath the skin, which slowly becomes larger and more prominent, and finally is felt to soften. The overlying skin is sooner or later implicated, becomes hyperæmic, thinner, and finally breaks down at one or several points, allowing the escape of the fluid matters beneath. Thus is established an ulcer. These ulcers vary greatly in appearance, size, numbers and duration, and heal after months or years, by the formation of variable scars. The process in its various phases has received the following names: scrofulous glands, scrofulous sores, white swelling, cold abscess, *gommes scrofuleuses*, *gommes scrofulo-tuberculeuses*. Similar

chronic changes resulting in destruction often take place in the skin overlying tuberculous disease of joints and bones.

Here, too, must be placed tuberculous dactylitis, a condition of the fingers and toes, principally the former, in young children, characterized by bottle-shaped enlargement and chronic inflammation of the over-lying integument, and terminating often in destructive ulceration of the same. This affection is of much more common occurrence than the syphilitic process, which it so closely resembles, and is, in my opinion, often mistaken for the latter. The ulceration resulting from all these forms, but especially that connected with scrofulous glands in the cervical region, sometimes extends far beyond the original underlying disease into the surrounding integument, and may continue to progress indefinitely, destroying large areas of skin, or new foci of ulceration may establish themselves in the neighborhood of the primary ulcer by the process of auto-inoculation without doubt.

Closely allied to these ordinary forms of glandular tuberculosis is a rare affection described by Hallopeau and Goupil under the title *Lymphangiectasie suppurative tuberculeuse*. Swellings form along the course of the lymphatics, varying in size from a filbert to a small egg. The overlying skin softens and ulcerates, and gives issue to a discharge of lymph containing bacilli. The process upon the lower legs is accompanied by much swelling.

Certain dermatoses have been regarded by writers as forms of scrofuloderma, as the so-called lichen scrofulosum. They are disorders of the skin occurring at times in patients who are affected by tuberculosis, but they are in no way tuberculous processes.

Perhaps some reference should here be made to Unna's "tuberculous eczema," so-called. That the

skin immediately surrounding tuberculous lesions in an active state may be stimulated into a sympathetic dermatitis of eczematous type is well known, and that an eczema in a person affected with tuberculosis of any tissue of sufficient gravity to impair general vitality may be somewhat modified by such an impression is not improbable, but I have seen no reason advanced for recognizing a specific tuberculous eczema. Such an appellation without proof is as objectionable to me as the expression "syphilitic eczema."

Finally, in connection with such pseudo-tuberculosis, I desire to state that in my opinion there is not sufficient evidence for regarding lupus erythematosus as an affection to be considered in this paper.

There are some other forms of disease of the integument, tuberculous in character, which are occasionally met with, closely allied to some of the clinical forms above described, which, I have reason to believe, are not ordinarily recognized as such, and which I have been in the habit of designating as unclassified tuberculosis. With the simple statement that they are mostly deep-seated, chronic processes of restricted area and often associated with evidences of tuberculosis elsewhere, I will not attempt to define them more particularly now. This is equivalent to the statement of my opinion that we are not yet thoroughly familiar with all possible manifestations of cutaneous tuberculosis.

Such then are the tissue changes by which tuberculosis manifests itself in the cutaneous structures. The mere enumeration of the processes shows how varied are the methods by which the skin expresses its resentment of the irritating presence of the virus. We find that we may have erythema, followed by deep infiltrations of corresponding size and hyperæmic elevations, ranging from small papules to tubercles of large size,

which may gradually undergo absorption and leave atrophied scars, or soften and remain in conditions of discharge and open ulceration indefinitely, destroying by serpiginous progress large extents of integument, and terminating in depressed or hypertrophied scars. Firm and densely sclerous infiltrations without marked tumidity and verrucous outgrowth, not tending to secondary changes. Forms of flattened papilloma-like hypertrophy of extremely slow development. Ulceration and destruction of the skin overlying glands primarily affected; deep and prominent, circumscribed nodular infiltrations often of considerable size (gummata), leading to destructive softening and ulcers of indolent type. Tumidity and breaking down of the integument covering phalanges, and primary affections of the larger bones and joints as well. In the surrounding areas of skin not immediately affected we may have dermatitis of various grades and kinds, as well as the implication of subcutaneous structures in the process, the glands, lymph vessels, fibrous tissues, cartilage and bones.

The particular nature of the minute anatomical changes which give rise to these varied appearances, it is not my province to speak of; this will be presented to your consideration by our more competent colleague, Dr. Bowen.

By the concurrence of certain of these lesions in various arrangements and combinations, differing somewhat in sequence, course and duration, in the locality affected and clinical history, more or less well-marked groups have come to be recognized as forming independent affections. It would be needless to look back over a satisfactory season as to the various types of cases which have been regarded as distinct affections. The observations and views which respect

for the dicta of the older teachers, antagonism of schools, have prevented us from recognizing and properly interpreting the identity of the anatomical and clinical features common to all these pseudo-independent phases. We see the same disposition to unduly magnify the importance and individuality of distinct clinical forms in the two great kindred diseases, syphilis and leprosy, until recently. Sharply marked dividing lines have been supposed to separate the former into well defined stages to the confusion of the student and practitioner, and the equally artificial division between the so-called anæsthetic and tubercular forms of the latter has largely delayed the recognition of its essential etiological nature. The true method of determining the mutual relations of the various diseased conditions we are discussing is by close observation of the features common to them all, and their points of approach and commergence (to coin a word) in individual cases, and not by confining our efforts to demonstrating how far apart certain selected clinical types apparently stand. Let us consider, then, what evidence we possess to-day, unbiased by previously formed opinions, so far as possible, of their clinical and etiological unity.

I. The concurrence of various clinical forms in the same individual.

Since my attention has been especially directed within the last few years to the question of the probable tuberculous character of various obscure conditions of the skin, which I had previously and hastily regarded as chronic inflammatory processes, warty hypertrophies, ulcers of uncertain origin, scrofulous sores, bone disease, questionable syphilitic lesions, or other undetermined cutaneous changes, which make up that too large residuum in the classification of cases in hospital clinics, often bunched under the title, "uncertain"

agnosis," and my understanding of their real nature has been made clear to me, I have been surprised to note the frequency of association of various clinical forms in the same person. Perhaps I cannot better illustrate such concurrence than by placing together the notes of cases bearing upon this point, which have fallen under my observation in the past three years.

(1) Girl, aged seventeen. Enlarged glands in neck in state of ulceration; extensive ulceration of surrounding skin; patch of serpiginous lupus on upper right thigh.

(2) Girl, aged eighteen. Chronic ulcerating glands in neck; chronic tubercles on leg in state of ulceration; ulcer on palate; lately, tubercular lupus of nose.

(3) Man, aged thirty. Serpiginous lupus of face, of varied type, said to have begun after a cut upon its site. Fifteen years' duration. Lately, a patch of deep tubercular infiltration upon arm.

(4) Girl, aged sixteen. Swollen glands in neck for eight years. Lately, active ulceration extending in broad belt from ear to ear.

(5) Girl, aged twenty. Scrofulous glands in neck, some of them in state of ulceration. Tubercular and ulcerative lupus on front neck. Sclerous lupus of face. Solitary and large tubercle on back.

(6) Child, aged eight. Verrucons tuberculosis of wrist. Lupus-like tubercles on knee and arm.

(7) Child, eighteen months old. Tuberculous dactylitis of fingers. Chronic scattered tubercles on same arm.

(8) Child, aged nine months. Dactylitis of one hand. Scattered nodules and tubercles on arms and legs.

(9) Child, aged six. Swollen glands in neck, surrounded by large areas of cutaneous ulceration; exuberant ulcerative lupus of nose.

(10) Man, aged sixty-three. Multiple tuberculosis

verrucosa of fingers of left hand. On same forearm tubercular, ulcerative and fibrous lupus occupying a large area.

Some of these cases offer striking illustrations as well of the concurrence of such cutaneous forms with pulmonary or deep joint tuberculosis, but I shall ask your attention to such association later. They will recall, I doubt not, many similar cases within the recent observation of all of you, and are numerous enough to establish the fact of the frequency of such mixed manifestations in the same person. The very frequent connection of lupus proper with the so-called scrofulous state, is well known. I need only refer to the familiar statistics of Raudnitz and Pontoppidan, recently collected. The former found evidence of scrofulosis in thirty per cent. of 209 cases of lupus, and the latter determined a scrofulous basis in a still larger percentage in lupus.

Several objections would be raised, I am aware, by the opponents of these modern views of unification to evidence drawn from facts as these just presented. First, that the simultaneous or consecutive occurrence of such forms is mere coincidence, or that lupus is associated with scrofuloderma, because they are both indications of a depraved vitality, although independent affections. This is, of course, simply a restatement of the old dictum, the very proofless assumption which so long remained unquestioned. Second, that the cutaneous lesions exhibited in my cases, with the exception of the "scrofulous" glandular disease, disposed of as above stated, were merely the protean manifestations of lupus alone. But this would be extending the definition of lupus to an extent so comprehensive as to include every form of cutaneous tuberculosis, or, in other words, to admit the unity we are contending for. Third, it may be asked, How do you know that

the extraordinary lesions described by you as associated with your lupus and scrofuloderma cases are tuberculous in their nature, admitting for the moment that the latter changes are so? Because in many examples of all these forms this fact has been established by careful examination of their anatomical and bacterial elements, and by inoculation experiments conducted by many competent observers. It may be also legitimately replied, How does one know that unusual forms of cutaneous lesions occurring in an analogous affection are positively syphilodermata? Does one challenge the syphilographer to establish such diagnosis by microscope and inoculation? No, one must trust the skilled observation of the accomplished dermatologist to recognize the nature and position of many changes in the cutaneous tissues by shades of difference in appearances so minute that they cannot be expressed in words.

II. The presence of the *bacillus tuberculosis* in all clinical forms.

The data on which this all-important proof of the essential identity of these conditions rests are now so numerous, have been gathered by so reliable observers in all parts of the world, and are on record in so many well-known publications, that it will only be necessary for my purpose to present them in as succinct a shape as possible.

(1) *Lupus*. In the active and developmental stages of every lesion recognized as characteristic of lupus vulgaris bacilli occur. They are found inside and outside of cells, often in the tissues surrounding the lesion, are always sparsely distributed, and are of low vitality compared with the activity they manifest in other forms of tuberculosis. In the retrogressive phases they are still less abundant, or cannot with our present tests be discovered at all.

(2) *Tuberculosis verrucosa*. The bacillus has been found in every active stage of every clinical variety of this form also.

(3) *Tuberculosis cutis*. In the various forms of disease above described under this head, including the general acute miliary affection and a variety of ulcerative processes, bacilli have been found, in the fluids of vesicular and pustular lesions, and in the secretions of ulcers.

(4) *Scrofuloderma*. In every form of cutaneous scrofulosis the bacilli also occur. In the glands in their active and caseous stages of inflammation, in the discharges from the overlying skin, when implicated in the process, and in the ulceration of the integument spreading from such foci or excited in surrounding areas through probable auto-inoculation. They were discovered also by Hallopeau in the suppurative lymphangiectasie described by him.

There are few dermatologists now, I presume, who doubt the occurrence of this bacillus in every form of cutaneous tuberculosis, or who misjudge the negative significance of its relative sparseness and inactive qualities in these various clinical phases. That this bacillus is the direct exciting cause of all the lesions we have been considering, there can be, I think, as little remaining doubt. The gross character of these cutaneous manifestations, their course, and their very diversity of type is in close analogy with that other great bacillus disease, leprosy, as with syphilis, whose kindred nature, I doubt not, will ere long be as positively demonstrated. It is of little moment to discuss whether the bacillus produces this manifold impression upon the cutaneous tissues containing it by its mere mechanical presence, or by the irritative action of ptomaines or other chemical agents produced by it, the responsibility rests upon the tangible bacterium.

That this bacillus in all these forms is the same, and that it is identical with that of pulmonary tuberculosis is proved by the results of

III. Inoculation Experiments.

Here, too, it would be wholly a waste of time for me to present to you the details of the experimentation so extensively conducted in all parts of the world since the introduction of this test by Professor Koch. It has established the following facts:

The bacilli of pulmonary tuberculosis when inoculated upon guinea-pigs produces tuberculosis. Pure and prolonged cultures of the same produce like results.

The cutaneous tissues of scrofuloderma, lupus, anatomical tubercle, tuberculosis verrucosa, and miliary tuberculosis have all repeatedly produced more or less general tuberculosis when inoculated upon this animal.

According to Lingard the intensity or virulence of the effects of such inoculation varies in accordance with the activity of the bacillus growth in these respective forms. Thus guinea-pigs inoculated with the tubercular matter found in sputa or verrucous tuberculosis, die of tuberculosis on an average in 80 days, inoculated with material from scrofulous glands in 206 days, and with lupus tissue in 331 days. These results are confirmed by Leloir's investigations. He regards the difference between lupus and other forms of tuberculosis, so far as their comparative virulence is concerned, to be one of quantity rather than of quality.

Now the natural conclusion from these experiments is that these materials, derived from such various clinical forms of disease, produce one and the same form of tuberculosis in animals, because they are all merely varying expressions of the same disease. An objection has been raised, as you know, to the soundness of

such conclusions on the ground that these inoculations should reproduce the respective local forms from which the material employed was derived ; that is, that lupus inoculated should produce lupus. Setting aside the reports of the few cases in which such local lesions have resulted as might be thus interpreted as too exceptional to establish such a possibility, it seems to me a perfectly satisfactory explanation, that the cutaneous tissues of the animals experimented upon are simply an unfavorable soil for the development of the bacillus tuberculosis. Is it not as difficult to inoculate leprosy upon animals (or syphilis) and does not the bacillus of leprosy show a strong selective affinity for certain human tissues over others? The inoculation of material from syphilitic lesions upon human tissues does not reproduce the form of lesion or stage of the disease from which it was derived. Why then should this be expected of the lesion or stage of tuberculosis hitherto called lupus? We know too little of the conditions which influence the biology of bacilli to permit such arguments to control legitimate deduction from the positive data furnished by these experiments.

IV. Auto-inoculation. Transference of infection from one host to another.

But opportunities are not wanting of studying the effects of the inoculation of many or all these forms of tuberculosis upon the human skin, although this has not been conducted by design or studied in the initial stages. Instances of the transference of the disease from one part of the cutaneous surface to another, or from one host to another, are so numerous that this origin of skin tuberculosis cannot be denied. The history of the sequence of development of many a case of multiple forms, of which examples from my clinic have been already cited, warrant this conclusion. The details need not be repeated. Cronier reports

cases in which lupus was developed after spontaneous openings of caseous lymph glands, collections of pus in bones, and deep fistulas. Five were cases of gland origin, three of osteomyelitis. Achard cites numerous cases of lupus verrucosus occurring on the seats of former subcutaneous gummata. Such secondary forms can immediately follow the evacuation of matter, or after long periods, if the discharge become chronic.

When we consider how exceptionally restricted is the seat of lupus generally, how extremely slow in its ordinary course to invade even its peripheral tissues, confining itself to a small and single area for twenty, fifty or even more years, it seems to me that the consecutive invasions of new territory, often widely separated from each other, can be most reasonably explained in the majority of cases on the theory of re- or auto-inoculation. We find in accordance with this view that multiple seats of lupus forms occur most frequently in children, in whom the disease is more active and open than in adults, whose cutaneous tissues are no doubt more susceptible of infection than those of the latter, and with whom transference of infectious materials from one part of the surface to another is so likely to occur from habits of picking sores, from the more frequent nudity of portions of the integument, and from the more restless contact of the hands with all parts of the body. Cases have been frequently reported where lupus has developed primarily upon the seat of wounds. We shall see below, other evidence of successful direct inoculation of tuberculous matter.

A study of the clinical history of cases shows, too, that cutaneous tuberculosis may be transferred from one person to another, without necessarily repeating the form from which it was derived. The following are cases observed by myself :

Child, aged eight. Verrucous tuberculosis of wrist. Scattered tubercles on knee and arm. A younger sister has similar tubercles on one arm of later development.

Girl, aged seventeen. Verrucous lesions and open ulcerating forms upon both feet. Serpiginous crusting lupus on one thigh. Duration of process three years. Has lived in closest intimacy with a sister who presents extensive areas of multiform tuberculosis of the skin of many years' duration.

I might refer to other instances of lupus occurring in more than one member of the same family within my experience, but these are under present observation. They are not of so frequent occurrence as to indicate that cutaneous tuberculosis is readily or often transferred from one host to another, and this is in accordance with our knowledge of the comparative inactivity or low vitality, and sparse development of the bacillus in these forms.

On the other hand, there is an extensive collection of observations, which demonstrate how readily the skin may become infected by bacilli in the more active condition and greater abundance in which they occur in the sputa of pulmonary tuberculosis. Jadassohn reports a case of the development of lupus upon the site of a tattoo mark, coinciding with the lines of the design. The operator had phthisis, and mixed his pigments with his own saliva. Dubreuilh has collected seventeen cases of tuberculosis of the penis after circumcision, in which the ritual operator was in consumption. The peculiar nature of this operation is well known to you all. In several of these bacilli were found in the lesions. Behrend gives an account of a patient with laryngeal and pulmonary phthisis, who was bitten by a guat on the finger, produced an excoriation of the part by scratching, and wetted it

repeatedly with saliva. This terminated in a sore, which did not heal, and presented every appearance of cutaneous tuberculosis. In Dubrenilh's case a young woman washed the handkerchiefs containing the sputa of a phthisical patient. Nodules developed upon her fingers, followed by swelling and suppuration of the axillary glands. In the next few weeks small nodules appeared along the course of the arm, which broke down and discharged. The original lesions upon the hands became verrucous. Bacilli were found in all the lesions and in the discharge from the axilla. Inoculation in guinea-pigs gave positive results.

Here follow the cases of cutaneous tuberculosis which have occurred under my own observation within the last three years, in which favorable conditions for such infection through sputa existed:

Woman, aged thirty-two. Chronic tubercular mass on thumb of two years' duration. For a long time previous to its appearance she had been nursing her husband in consumption.

Child, aged eighteen months. Scattered tubercular lesions on arm, with dactylitis of hand. Mother died of consumption after nursing it six months.

Child, aged nine months. Dactylitis and many scattered tubercles on limbs. Mother had phthisis.

Woman, aged sixty-five. Diffused infiltrated patch on back of hand, and verrucous lesion on finger of same. Was nursing daughter in consumption when it appeared.

Woman, aged sixty-six. Multiform lesions on back of left hand and forearm of six years' duration. It appeared while nursing daughter in consumption.

Child, aged twelve. Open ulcerative lupus of nose. Sclerous lupus on neck. Sister has ulcerative tuberculosis of palate.

Woman, aged fifty-eight. Verrucous tuberculosis

of finger. It appeared two years ago, just after nursing daughter, who died of consumption.

Woman, aged forty-eight. Open ulcerative tuberculosis of left wrist of eighteen months' duration. Husband and daughter have died of consumption within the last two years. The latter had "open sores."

Girl, aged six. Swollen glands in neck, surrounded by extensive ulceration for three years. Exuberant ulcerative lupus of nose of six months' duration. Father died of consumption when she was fourteen months old.

Man, aged sixty-three. Numerous tubercular and ulcerative lesions covering large areas upon the left forearm. Several deeply infiltrated verrucous forms on fingers of left hand. The disease began on finger seven years ago, about the time of the death of wife from consumption.

Woman, aged twenty-four. Tuberculosis verrucosa of left forefinger of five years' duration. Mother died of chronic consumption two years ago, and was nursed by her.

Woman, aged forty-eight. Verrucous tuberculosis of two fingers of nine months' duration. Had previously attended a patient in consumption, who had also had for four months an "open sore" on neck.

These cases of probable inoculation might be corroborated by great numbers of others taken from recent reports. Dubreuilh, who has collected sixty of them, presents the following account of the usual course of the process: The earliest lesions after inoculation in an adult are generally either a panaris or an ulcer with a livid erythematous border, becoming later verrucous in portions or over its whole area. In the vicinity of the primary sore nodules, either within or beneath the cutaneous tissues, often appear along the course of the lymphatics, presenting at times the as-

pect of scrofulous gummata, and followed by adenitis. In infants tuberculous meningitis has often supervened, and in adults these local manifestations have frequently terminated in pulmonary tuberculosis. He concludes farther, that infective matter derived from surgical tubercle, which is poor in bacilli, produces a cutaneous tuberculosis of slow progress, lupus forms, which is also poor in bacilli, whereas the inoculation of tuberculous sputa gives rise to painful ulcerations and carious lesions rich in bacilli.

Now it may be claimed that all such cases as these by no means prove the fact of inoculation, but that they may be explained on the old theory of diathesis, which has hitherto given such complete and easy satisfaction. Everybody must admit that diathesis, so-called, is only an inferential condition, and rests on no scientific or tangible basis whatever, whereas inoculation with infective matter and consecutive tissue changes, both local and universal, is a fact capable of the clearest demonstration. If, then, we can explain a series of observed facts, which closely resemble in their successive details the undoubted phenomena produced, artificially or otherwise, by inoculation, why should we ever think of interpreting their occurrence on a purely imaginative basis of causation? Why should we resort to pure assumption or supposition until natural and physical methods of accounting for their occurrence are first shown to be of impossible application? The days of diathesis are numbered, I believe, and their figmentary existence will vanish when it is shown that they are no longer necessary to explain the occurrence of diseases which closer observation is demonstrating to be capable of interpretation under laws which come within the scope of scientific reasoning and experimentation. A diathesis will, in my opinion, ere long be shown to be as unnecessary for the ex-

planation of all the phenomena of tuberculosis, as it is to-day for leprosy, and always has been for syphilis.

In every one of the cases I have reported from my own observation, the undoubted opportunity for inoculation was present. It is, of course, impossible to fix the precise date of this event in studying the history of a case at a period so remote from its inception, nor have we yet positive knowledge of the period of incubation, or sufficient data as to the appearances of the earliest local manifestations after inoculation. Such evidence as these family cases present would be accepted without the slightest hesitation as a satisfactory explanation of the source of syphilitic infection developing in wife, child, or nurse of a patient affected with this disease. Why then should we regard with more scepticism the lessons as to the contagiousness of tuberculosis which these cases teach? When we consider the possible opportunities of contact with the infectious sputa of consumption, which occur in families under the existing carelessness and ignorance concerning their dangerous character which everywhere prevails, it is only surprising that such cases are not more frequent. It can only be explained on the ground that the cutaneous tissues of man are but slightly susceptible to the reception, and afford an infertile soil for the development of the bacillus tuberculosis. Leloir, in his recent communication to the *Congrès de la Tuberculose*, gave the results of his inoculation of lupus tissue upon animals in two hundred cases. He found that it never produced tuberculosis in the guinea-pig when inoculated into the hypoderm, but that it almost infallibly produced the disease when inoculated into the peritoneum of the same animal. It may be considered probable, indeed, that a sound epidermis is a complete shield of safety against the dan-

gers of inoculation by surface contact. Would that the mucous membranes possessed the same immunity!

V. Association with pulmonary tuberculosis.

Another proof of the identity of these various forms of cutaneous disease with tuberculosis, is their by no means infrequent connection with the pulmonary form in the same person. I need only quote from well-known statistics to establish this significant concurrence: Besnier has reported that twenty-one per cent. of his lupus patients died of phthisis; Leloir states that of nineteen lupus cases ten were in consumption; Sachs reports that of 166 cases of lupus thirty-four per cent. had tuberculosis in some form before the cutaneous manifestations, and sixty-two per cent. subsequent to the development of the latter. Such ratios might be largely extended by quoting the figures of other observers. The following three cases from my clinic within the last year will serve as an illustration of such association of forms in America, an experience which would be corroborated by the observation of all who are present, I have no doubt.

Girl, aged sixteen. Lupus of nose of six years' duration. Unmistakable signs of tuberculosis of right upper lung.

Woman, aged forty. Tuberculosis of left thumb, and palm and back of right hand. In advanced chronic consumption.

Man, aged thirty-five. Sclerous and ulcerative lupus of upper thorax. Apex of lung affected.

The secondary infection of the skin in pulmonary tuberculosis admits of ready explanation, for sputa rich in active bacilli must be constantly coming in contact with the fingers in the use of the handkerchief, and the hands are often used to wipe the mouth after expectoration or coughing among the poorer classes, as is well known. The prevalence of such uncleanly

habits and the infrequency of such transfers, strongly illustrates, as just mentioned, the immunity of the skin to such chances.

The development of pulmonary tuberculosis subsequent to the existence of cutaneous forms upon an individual, may be explained, of course, by the direct transfer of infective matter from open lesions upon the surface to the air-passages, and such extension to internal organs in any way is in accordance with the clinical record of kindred diseases. The manifestations of syphilis may be confined wholly, or for a considerable period of its course, to the skin, whilst in leprosy it may long be the only field of exhibition before other tissues are affected.

I should not neglect in this connection to mention the opinion which prevails among French dermatologists, that pulmonary tuberculosis is often developed as a result of the operation of scarification, as used by them in the treatment of lupus, in consequence of thus setting free the bacilli to enter the general circulation.

In connection with this question of self-infection, it may be of interest to note that at the meeting of the *Congrès de la Tuberculose* just referred to, M. Lespinne described certain manifestations observed at times in cases of lupus, chiefly in ulcerative forms, which indicated a general intoxication of the system. They consisted of rapid elevation of temperature, catarrhal symptoms of the mucous and serous tissues, and a typhoidal condition, simulating a dothinenteritis, or acute miliary granulation. As soon as the elimination of these infectious products has been accomplished, these phenomena disappear, or they may be the precursor of a more general tuberculosis. He has seen them terminate in this disease of the peritoneum and lungs. In his opinion this state of general infection could be caused either by the bacilli or the agents of suppuration in the lupus tissue.

With all this accumulation of varied evidence bearing upon the question, the concurrence of various forms upon the skin of the same person, the demonstration of one bacillus in all these clinical forms, the uniform results of the inoculation of such tissues and the bacterium itself upon animals, the clinical proofs of re- or auto-inoculations of these forms upon the original patient and of their transference to others, the established association with pulmonary forms of the disease, with all this evidence, I say, I do not see how any reasonable doubt can be entertained with regard to the essential identity of every form of tuberculosis with which we are acquainted.

RELATIVE FREQUENCY OF CUTANEOUS FORMS.

It has been common belief amongst us that lupus is far less prevalent in this country than in Europe, whilst pulmonary tuberculosis is of more frequent occurrence here than there. Of the correctness of the former opinion I have presented statistical proof to this Association in former communications.² Such unequal prevalence among nations may well be explained by the differences in habits of personal cleanliness which characterize them. But with the enlargement of our definition of lupus we have been considering, these figures need revision, and the inquiry should comprehend all forms of cutaneous tuberculosis. With regard to the comparative prevalence of these various clinical forms amongst ourselves, I can only present the following brief statistics gathered from my own observations during the last two years in my clinic at the Massachusetts General Hospital. In this period sixty-nine new cases of cutaneous tuberculosis were recorded, representing the following clinical varieties: Scrofuloderma, thirty-four; lupus vulgaris,

² Variations in Prevalence, etc., 1876. Immigrant Dermatoses, 1890.

five; other forms, thirty. This subdivision is not intended, of course, to represent sharply differentiated processes in all cases, but it loosely expresses with sufficient accuracy, the relative prevalence of the clinical varieties as they occur here. The ratio of their combined number to all cases of skin disease observed at my clinic during the same period is 69 to 4,644.

AGE.

It was the tenet of Professor Hebra that lupus rarely, if ever, developed after the age of twenty, and usually showed its first manifestations in childhood. This rule was often used to determine diagnosis in doubtful cases. It may be that typical lupus does present itself in the majority of instances at this early period of life, and, if so, it must be accounted for by the greater susceptibility of the skin in youth to the reception of the specific germ. We see confirmation of this in the character of the lesions and the greater activity of the process which lupus always exhibits at this age, and its not infrequent spontaneous and complete extinction after middle life. So far, however, as the history of the other clinical forms we have been considering, teaches, it is apparent from the case above cited within my observation, that no such limitation to the dangers of inoculation exists, and that the skin exhibits such susceptibility both in middle life and at advanced age.

HEREDITY.

Upon this important etiological question, I beg to reproduce here, the opinion I expressed in a paper on "Hereditary Dermatoses" communicated to the International Congress of Dermatology and Syphilography held at Paris, in 1889, and I do this with less

hesitation because it has not been published in a form generally accessible to members of this Association.

That general or pulmonary tuberculosis is hereditary and transmissible has been commonly accepted as a perfectly settled fact, as it seemed to furnish the only plausible ground for its marked occurrence in families. It has never been denied, however, that it might develop independently of inheritance. When its bacillus nature was recognized, it furnished a satisfactory explanation of the occurrence of the latter class of cases. But it also raises the question, if it will not likewise account for cases hitherto regarded as hereditary, that is, for every case. Admitting the infectious character of tuberculosis in any form at all, and the capability of transference from person to person by direct contagion or inoculation, is the theory of hereditability longer necessary? *A priori* we cannot deny the possibility of intra-uterine infection, even if the connection between mother and foetus is so little directly intimate, nor of the preceding bacillous inoculation of ovulum or the male germ. Such cases of congenital infection are extremely rare. The burden of proof in this question should, it seems to me, as was said of leprosy, be transferred to the advocates of the hypothesis of heredity. As to the transmission of a predisposition which shall render a person more liable to the disease after birth, but which is not the disease and requires a fresh infection to make such peculiar fertility available, that is a nicety in the problem of heredity which I cannot appreciate, considering that the bacillus of every form of tuberculosis is readily received and developed in the normal tissues of perfectly healthy animals. So, too, with regard to some tissue changes of childhood regarded as the indirect result of tuberculosis and not tuberculosis itself.

Mr. Francis Galton, in his recent interesting work

on "Natural Inheritance" gives the history of 66 marriages in which one of the parents had "consumption." There resulted from these unions 413 children, of which number 107 had, or were suspected to have, consumption, equal to twenty-six per cent. Inasmuch as its prevalence in the general population is sixteen per cent., his inference is that this increase in rate may be fairly attributed to the greater chances of infection in such families. He found, too, that when the mother was the consumptive parent, the proportion of consumptive children was larger than when the father was the affected parent, which he explained by the fact that during infancy the child "lies for hours daily in its mother's arms, and afterwards lies much by her side, breathing the tainted air of her sheltered rooms." If the infant may acquire the disease from the milk of tuberculous cows, why not also from that of its diseased mother? We may not claim then that any case of cutaneous tuberculosis in any form is inherited until every possible source of extra-uterine infection has been eliminated.

CONCLUSIONS.

In conclusion, it seems to me, that on the evidence in our possession, collected within the last few years, under a more enlightened and unbiassed judgment as to its pathology, and presented in a necessarily brief and incomplete form in this paper, we are warranted to regard the various clinical conditions of the skin we have been considering, as simply cutaneous phases of one comprehensive affection, which, with its pulmonary and other tissue manifestations, constitute that most important of all diseases, tuberculosis; as much a unit as the equally multiform cutaneous lesions and other tissue changes which characterize syphilis and leprosy. In my opinion it would greatly conduce

to the quicker adoption of this consistent view of the true relations of all its forms, if we should entirely cease to make use of such independent terms as lupus and scrofuloderma, and hereafter designate such clinical or local varieties by no more distinctive titles than we employ in the description of the manifestations of leprosy or syphilis. The sooner and clearer we make it apparent to the public and the profession that all lesions of tuberculosis are dangerous and contagious, and mutually convertible, the more easily shall we gain control over the future course of the greatest scourge of mankind.

THE PATHOLOGY OF CUTANEOUS TUBERCULOSIS.¹

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IN this paper, that I have the honor to contribute to the discussion upon the subject of cutaneous tuberculosis, I shall confine myself as closely as possible to the anatomy of the various forms of this disease, considering that allied questions often discussed under the head of pathology, will be presented more properly by the other participants.

Under the head of cutaneous tuberculosis, we must include, in the present state of our knowledge, scrofuloderma, lupus, and two other clinical forms that were not until recently admitted to a place in this class. These two forms, the only ones, with the exception of lupus and scrofuloderma, that have offered substantial claim to be considered as distinct varieties, are the miliary tuberculosis and tuberculosis verrucosa cutis. We have thus four forms of cutaneous tuberculosis to consider, scrofuloderma, lupus, miliary tuberculosis and tuberculosis verrucosa cutis. The claims of tuberculosis verrucosa cutis to be regarded as a distinct variety have sometimes been questioned, and will be considered in their proper place.

No one doubts to-day that in tuberculosis we have to do with a chronic infectious disease caused by the action of a specific bacillus. The work of Koch and Baumgarten, together with the valuable contributions

¹ Read at the meeting of the American Dermatological Association, in Washington, September 23, 1891, introductory to the discussion upon Cutaneous Tuberculosis.

of other investigators, has demonstrated this truth so brilliantly and positively, that no other belief in the domain of pathology can be regarded as more securely established. Furthermore, the same investigators have cleared up the mystery surrounding the term scrofula, by demonstrating that the larger part at all events, of the affections formerly termed scrofulous, are in reality tuberculous troubles, caused by the tubercle bacillus. In proof of this, they have shown that this bacillus is constantly present and capable of culture in generations, and that these cultures when inoculated upon other organisms produce a true tuberculosis. The subject of lupus has also been vastly illuminated by the pathological studies that have followed in the wake of the discoveries of Koch. For a long time searched for in vain, it was finally proved by Koch, Doutrelepon and others, that the bacillus of tuberculosis, although very sparingly represented, could be demonstrated by a prolonged search in sections of lupus tissue, and further experiment showed that it could be cultivated in generations, and produce tuberculosis by inoculation upon animals. The sole pathological proof that to the most skeptical could now be wanting, was the production of lupus itself by inoculation, and although the clinical evidence that lupus may sometimes at least be caused by a direct inoculation of sputum or other material rich in tuberculous virus, is increasing, it must be admitted that experiment has not as yet succeeded in producing this disease in animals. In consideration of the insusceptibility of the lower animals to many forms of human disease, it seems probable that the last doubt will have to be dispelled by an overwhelming accumulation of clinical facts. The anatomist may fairly demand the aid of the clinician, and an intelligent judgment can only be formed by a consideration of all the evidence.

The tubercle, the product of the tubercle bacillus, is a nodule of so-called granulation tissue, composed histologically of small, round cells deeply stained by coloring agents, together with larger cells possessing a clear nucleus, that have been called epithelioid cells, and large cellular elements, with peripherally arranged nuclei and homogeneous centre, the Langhans giant cells. These cells are enclosed between the meshes of connective tissue, and are characterized, in distinction from normal cells, by their instability. Sooner or later a modification begins in the nodule. Its centre becomes necrotic, that is, the cell protoplasm is coagulated, the nuclei lose their power of responding to staining agents, the intercellular substance also takes part in the degeneration, and there results a coagulation necrosis in the Weigert sense, a condition that has been usually termed a cheesy degeneration. This term, cheesy degeneration, has given rise to much confusion. Virchow long ago pointed out that it was in no sense a condition peculiar to tuberculosis. Its use should be restricted to the macroscopical appearance and consistency of certain products of degeneration, dropping the term entirely from the nomenclature of microscopy.

It has been claimed, at various periods in the history of tuberculosis, that both the cheesy degeneration and the Langhans giant cell were pathognomonic of the affection. Neither of them can now be considered as a specific attribute, inasmuch as cheesy degeneration is found, as has been said, in numerous other conditions, and as the Langhans giant cell, while still retaining an especial association with tuberculosis, can frequently be seen in its typical form in the tissue about vessel ligatures, and in several forms of syphilis — notably in gummata and in the small papular or lichenoid variety. Baumgarten's view that those cases

syphilis in which the Langhans giant cell is found, are a complication of syphilis with tuberculosis, has not been supported by microscopical study nor by experiment. No one has claimed to have found the bacillus of tuberculosis in a gumma, or in a papule of lichen syphiliticus, and experiments upon animals have failed to produce tuberculosis by the inoculation of these syphilitic products. Still, while the Langhans giant cell has lost its claim to be regarded as specific, a certain amount of diagnostic value must be allowed to it, when seen, as there is as yet, so far as I am aware, no record of its discovery in pathological processes other than those of tuberculosis and syphilis.

While it may be said that the course and life history of the tubercle, together with its tendency to progress in the adjacent tissue are to some extent specific, the sole feature that we have practically to regard as pathognomic, is the presence of the tubercle bacillus. The doctrine of to-day reads, every neoplasm that contains the bacillus of tuberculosis is tubercle, and in every tubercle the bacillus must be present, however, sparingly.

Great progress has of late been made in the histogenesis of tuberculosis, by the aid offered by the tubercle bacillus, and by the discovery of new methods of hardening and staining. These methods were inaugurated by Flemming in his search for the evidences of nuclear division, and have been constantly extended and improved. The belief that had existed for some time, under the influence of Cohnheim's exudation theory, that the epithelioid and giant cells of tubercle are produced from the emigrated white blood cells, has been essentially shattered by the experiments of Baumgarten.

Baumgarten introduced bits of tuberculous tissue into the anterior chamber of the eye of guinea-pigs,

and allowed the infection to progress for varying lengths of time, when the animals were killed, and the tissue subjected to the modern methods for the detection of karyokinesis. On the second day there begins to be an increase in the number of bacilli, which spread into the neighboring tissue. The first signs of the new tubercle are epithelioid cells, which are seen to be produced from the fixed tissue cells by karyokinesis, and not from the leucocytes or small, round cells. Indeed, the leucocytes are not observed until a later period in the development of the tubercle, and no karyokinesis has been seen in them at any stage. Hence Baumgarten regards the epithelioid cells as derived from a proliferation of the fixed tissue cells, and not, as had been supposed, from the leucocytes. It has been doubted whether we are yet justified in regarding the epithelioid cells as in all instances derived from the fixed cells alone, and the history of tuberculosis, with its ever changing beliefs, may properly urge upon us caution in our positive assertions. Nevertheless, the experiments of Baumgarten have proved conclusively that the emigrated white blood cells bear a subordinate part in the development of the tubercle, and that the normal cells of the affected part are the first to be impressed by the virus, which causes them to assume the epithelioid shape. Next occurs the infiltration of the tissue with leucocytes, which may be present in greater or lesser numbers. When the infiltration with leucocytes has reached its acme, there begins to be a degeneration and death of the cells forming the tubercle. The leucocytes are probably the first to degenerate, they refuse to become stained, and a molecular detritus results. The epithelioid cells are the next victims to the degeneration, their protoplasm begins to shrivel up, and a coagulation necrosis is produced. A further step in the

degeneration is a softening of the necrotic mass, and the appearances of a suppuration are falsely produced. But there is no suppuration in tubercle strictly speaking. No pus cells are found with the microscope in pure tubercle, and there can only be a real suppuration when the tuberculosis is complicated with a septic process.

The histogenesis of the Langhans giant cells has been the subject of much controversy. The best belief of to-day is that they are formed not by confluence of several cells, but by nuclear proliferation of a single cell, with failure of the protoplasm to divide. According to Weigert's view, the Langhans cell represents a tubercle in miniature. The centre of the cell undergoes a partial coagulation necrosis, while a proliferation of the nuclei occurs faster than the cell body can divide, thus giving us the picture of a single cell with nuclei arranged along its edge, and a homogeneous centre of necrosis. The failure of the protoplasm to divide so fast as do the nuclei, is probably caused by the irritant not being powerful enough to carry the process of cell proliferation beyond its first stage, that of a division of the nucleus. The irritant in the case of tuberculosis is the tubercle bacillus, and if the bacilli are present in great numbers, the Langhans cell is not found, as the cell proliferation occurs so quickly that the cell division keeps pace with the nuclear division. This theory is strikingly supported by the case of lupus, where the bacilli are very sparingly present, and where for this reason the number of Langhans cells is very large — much larger than in acute miliary tuberculosis, for example, where the whole process is accelerated, and the bacilli are found in great numbers. Furthermore, the Langhans cells often contain bacilli, situated along the periphery, the part that still lives, and to which they turn for nourishment when the centre has become necrotic.



The theory of Metschnikoff with regard to the Langhans cells of tubercle should be mentioned, on account of the attention that it has excited, and of the ingenuity with which its originator has argued its claims. His theory is that the protection of the organism against many species of bacteria lies in the white blood corpuscles, which seek out the bacilli for their nutriment. The cells that thus receive and feed upon the bacteria, he has called phagocytes, and to this class the Langhans giant cells of tubercle belong. A struggle for existence is constantly taking place between the cells and the micro-organisms, and the bacilli when overwhelmed by their antagonists, are subjected to an intra-cellular digestion by which they are annihilated. Able supporters have rallied to Metschnikoff's aid in his phagocyte theory; but without entering further into the controversy that has arisen, it must be said that the active characteristics that the Langhans cell must possess in order to carry on its warfare with the tubercle bacilli, have not been satisfactorily proved, and that the weight of authority is not in favor of this theory.

Turning now to the special features presented by cutaneous tuberculosis, the first form to consider is:

MILIARY TUBERCULOSIS OF THE SKIN,

as this is the form that represents almost exactly the tubercle of internal organs. It has been called by the French "tuberculose ulcéreuse," but as the property of ulceration is common to many forms of cutaneous tuberculosis, the better title is that of miliary tuberculosis, on account of the almost constant presence of miliary nodules in process of rapid necrobiosis. Clinically this form consists of painful ulcers situated at the juncture of the mucous membrane with the skin at the entrance to the mouth, nose, anus and vagina.

and also upon the ear, in patients suffering from pronounced tuberculosis of internal organs. This form is also met with on the mucous membrane alone, and rarely attacks the skin except by extension outward from mucous surfaces. The edges of the ulcer are characteristic, being made up of a series of small indentations, looking as if punched out. Miliary tubercles in the form of yellowish-white transparent nodules can usually be seen in parts of the ulcer. The lesions are rapidly progressive, from a degeneration of the miliary tubercles, and from the confluence of the small ulcers. To Chiari and Jarisch are due the first accurate descriptions of this form, at a time when the tubercle bacillus had not been discovered. Chiari's observations prove the rarity of these ulcers for they were found in only five cases out of a total of 7,000 autopsies, sixty per cent. of the subjects of which were tuberculous.

These lesions have not, so far as my knowledge extends, been studied in the light of the modern histological methods. But all the pathological examinations that have been made, tend to prove the similarity of their structure to that of the miliary tuberculosis of internal organs. The cutis is found to be filled to a considerable depth with foci of small, round cells, with occasional epithelioid and Langhans giant cells. In the centre of these foci the necrosis has progressed rapidly, so that upon macroscopical examination the appearances of softening and cheesy degeneration are apparent. The tubercles often by their coalition form masses of softened and necrotic tissue, in which the evidences of unaltered granulation tissue can only be found in the outlying parts.

In the number of bacilli found in this miliary form there is, I am convinced, a further analogy with the miliary tubercle of the internal organs. In the cases

that I have examined they were present in large numbers, in one every field contained enormous masses, and this accords with the experience of Riehl, Doutrelepout and others.

This form has often been classed as a true tuberculosis of the skin, and offered as a powerful argument against the tuberculous nature of lupus, on the ground that the bacteriological and histological features of lupus differ in many respects from this miliary form. That this form presents characteristics not seen, as a rule, in lupus, is freely admitted, but the differences are just those that distinguish an acute from a more slowly progressive tuberculosis of other parts. The process in the miliary form runs a more rapid course. The cells are speedily transformed into masses of necrosis of a cheesy consistency, and the cause of this accelerated degeneration lies in the great numbers of tubercle bacilli, — phenomena that have been shown to be the rule in acute miliary tuberculosis.

SCROFULODERMA.

The term scrofuloderma is used to describe those cases of tuberculosis where the subcutaneous tissue and the lower portions of the corium, are the seat of the morbid process. Very commonly the starting point is a lymph gland, in which the tuberculous material is formed under the influence of the bacilli, becomes necrotic, and finally breaks into the overlying tissues. Where several lymph glands are involved, deep ulcers with fistulæ of various lengths are often produced. The anatomical character of scrofuloderma differs in no essential way from the tuberculosis of internal organs. A granulation tissue of small round and epithelioid cells, with a moderate quantity of Langhans giant cells, has its seat in the subcutaneous tissue, becomes degenerated, and may break throu-

the thinned and tense layers of the epidermis above, giving rise to the well-known ulcer with soft undermined edges. The degeneration is usually much farther advanced than in lupus, large areas of necrotic, softened tissue being usually visible under the microscope. Experiment by inoculation has, as has been said, proved beyond a doubt that these scrofulous glands and ulcers are a tuberculosis of the subcutaneous tissues. The specific tubercle bacilli are always present. Their detection may, in some instances, be a matter of considerable difficulty; in others they are very abundant, and in general they are much more numerous than is the case in lupus, but not so thickly sown as in the miliary form just considered.

LUPUS.

In lupus we have a tuberculous affection, having its starting point in the corium, affecting primarily the lower portions, progressing upward by extension of the foci of disease, and causing in most instances secondary and non-specific alterations of the epithelial elements. Before the discovery of the tubercle bacillus, histological investigation had already pointed out with much clearness the resemblance existing between the anatomical features of lupus and tuberculosis. Friedländer contributed more than all others to a correct appreciation of this similarity, and argued that the points of difference were not distinctly defined enough to separate the two affections. A considerable controversy then arose between the advocates and opponents of the identity of the two affections on anatomical grounds. Baumgarten pointed out that the cheesy degeneration, so constant in tubercle, was wanting in lupus; that lupus tissue presented less epithelioid and more giant cells; that lupus was more vascular, gave rise to a greater formation of connective tissue, did

not present so sharply defined miliary nodules, and was capable of direct suppuration. For these anatomical reasons he considered that lupus should be separated distinctly from tuberculosis. These points of difference, that are true in the main, are now cited to prove the identity rather than the dissimilarity of the affections. Suppuration, however, cannot be claimed as an attribute of lupus, any more than of tuberculosis, as Neisser has pointed out, and as is now generally acknowledged. What we have been accustomed to call suppuration is in reality a breaking down and softening of the granulation tissue. A true suppuration often occurs, but only when a septic process is engrafted on the tuberculous tissue. With regard to the other objections of Baumgarten, they are precisely the points of difference between a rapidly progressive and a more chronic and less virulent process. "Cheesy degeneration," the synonym for an advanced necrobiosis, is not seen in lupus, on account of its slow progress and the small number of bacilli that are present. Whether or not the soil is here unfavorable to their existence, as has been often suggested, they are found in much smaller numbers in cutaneous than in most other forms of tuberculosis. Miliary cutaneous tuberculosis offers the sole exception to this rule, as here the bacilli are usually found in great numbers, and therefore, as would be expected, the tissue presents anatomically a more advanced necrosis.

The larger representation of giant cells and the smaller number of epithelioid cells as seen in lupus, are also characteristics of the more slowly developing forms of tuberculosis, as has been shown by experimentation upon animals, by feeding them with attenuated cultures of tubercle bacilli. In these experiments a very slow and sparse proliferation of the bacilli takes place, and the neoplasin does not progress beyond the

stage of the primary epithelioid cell tubercle, or to one verging upon the lymphoid cell tubercle — much the same appearances that we meet with in lupus.

The histogenesis of the Langhans cell has already been referred to in speaking of tuberculosis generally, and the increased numbers of these cells in lupus was evidenced in support of the belief that they are produced when the specific irritant is not powerful enough to effect a division of the cell protoplasm so fast as the nuclei are divided, — the specific irritant being the tubercle bacillus, and sparingly represented in lupus tissue.

Thus, it should be emphasized, that from a purely anatomical standpoint, lupus cannot be separated from tuberculosis. Baumgarten himself, who, as has been seen, was one of the chief opponents of the tuberculous theory from anatomical reasons, declares in his textbook that not the shadow of a doubt can now exist of its true tuberculous nature.

From the experiments that have been alluded to as proving that the epithelioid and giant cells of tubercle are in the main derived from a proliferation of the fixed tissue cells, and not from the emigrated white blood corpuscles, we may confidently assume that the newly-formed cells of lupus are produced in the same way. The first appearance of the lupus tissue is found to be an accumulation of cells, situated about the capillaries and lymph channels, in many cases representing a growth of the adventitia of these vessels. But all connective tissue cells that are affected by the virus of tuberculosis are capable of this metamorphosis, and in view of Baumgarten's experiments, the possibility that the epithelial glandular elements may also take part in the process cannot be excluded. Few studies of the histogenesis of lupus cells have been made in the light of the newer methods of staining and of the

conclusions derived from experiments upon the iris. Unna in a recent paper has published the results of his investigations in this direction. He regards the epithelioid cells of lupus as identical with the "plasma zellen" of Waldeyer, and as distinct from Ehrlich's "mast zellen." These plasma cells, he says, represent the first stage of the cutaneous tubercle, and are not derived exclusively from the endothelium of the capillaries, but from any of the fixed connective tissue cells. He finds nowhere any evidence of the transformation of wandering cells into epithelioid cells, as has been heretofore assumed; the few wandering cells found in the vicinity of the process are sharply distinguished by their small size and by their deeply-stained nuclei, from the epithelioid or plasma cells.

A point of considerable interest in Unna's investigations is his claim that the agglomerations of small, round cells found at the periphery of the lupus nodule are not leucocytes, as is even now assumed, but early derivatives of the epithelioid cells, as is shown by methods of protoplasmic staining. So much, at all events, seems to be settled—that the rôle of the leucocytes in lupus, as well as in other chronic inflammatory processes, has been greatly exaggerated, and that the fixed tissue cells are, at least in the main, the parents of the epithelioid and giant cell formations.

The next stage in the history of the lupus tubercle is the degeneration of the newly-formed cells and of the fibrillary tissue. The cells lying in the centre of the nodule are the first to be affected, their protoplasm becomes homogeneous, while the nuclei lose to a certain extent their susceptibility to staining. Following Weigert, the cells in lupus, as in internal tuberculosis, are regarded as undergoing a coagulation necrosis. Unna opposes this view, on the ground that no coagulation of the protoplasm can be determined, and that

there is no death, as yet, of the cell. However this question may be decided, the process is a degeneration of the tuberculous elements under the toxic influence of the bacteria, and represents the first stages of a necrosis, that is, on account of the small numbers of the bacilli, of slow progression — a stage that we never see in the acute forms.

Together with this degeneration taking place in the epithelioid cells, there is also a regenerative process. The cells are capable of proliferation, when not affected by the virus to the extent of advanced degeneration, and may finally become converted into connective tissue. In this manner is produced the lupoid scar-tissue, that takes the place of the lupus nodule, in the process of healing. Unna, in his work just referred to, regards the scar-tissue in cases of spontaneous healing of lupus infiltrations as different from that following an ordinary loss of tissue, in the fact that there is never a reproduction of elastic fibres, that the connective tissue is never arranged in intersecting bundles, but is placed horizontally to the surface, and that it contains numerous large "cell spindles," rich in protoplasm, which upon section give the skin a striped appearance. Hence he regards this cicatricial tissue as a true lupoid tissue, and not an indifferent substitute for the absorbed tuberculous elements.

An advanced stage of the regenerative process is seen in the elephantiasis that occurs in lupus. Here the tendency to the formation of new connective tissue is so great, and dominates the degeneration to such a degree, that large portions of the body are converted into dense masses of hypertrophied fibrous tissue, containing foci of degeneration to a greater or lesser extent, and presenting clinical appearances quite similar to those of advanced elephantiasis. This formation of

new connective tissue in greater or lesser degree as compared with the necrobiosis is one of the causes of the multiplicity of clinical forms exhibited by the affection.

Another complication of lupus is the proliferation of epithelial elements that may take place. So far as our knowledge of the process extends, we must regard these phenomena as secondary and non-specific, caused by the irritation produced by the new formation, and analogous to the epithelial activity in syphilis and other chronic inflammatory processes. The rete may extend its interpapillary prolongations deep into the corium, and with the outgrowth of the papillæ, that is so constantly allied to the epithelial proliferation in all papillomata, the clinical forms of lupus papillaris, verrucosus are produced. A proliferation of the glandular elements may also take place, as was emphasized long since by the studies of Lang.

When the tuberculous infiltration of the corium has reached a certain grade of intensity and the overlying epidermis has become stretched and thinned by the pressure from below, there frequently results a fracture of the epidermis, and the tuberculous foci are laid bare, giving rise to the forms of lupus ulcers. In these instances there frequently, if not usually, exists a complication with a septic process. To the presence of the pus micrococci we must refer all true suppuration that attends a lupus lesion. The pus micro-organisms are very readily engrafted upon cutaneous lesions of any nature, and the tuberculous lesion shares with others the liability to this complication.

TUBERCULOSIS VERRUCOSA CUTIS.

The last form of cutaneous tuberculosis, the anatomy of which we have to consider, is that affection first accurately described by Riehl and Paltauf, under the

name of tuberculosis verrucosa cutis, a form nearly or quite identical with the anatomical wart so often found on the hands of those engaged in dissecting rooms and at the autopsy table. As described by Riehl and Paltauf the anatomical characteristics consist of greatly elongated and enlarged papillæ, covered with a thickened, lamellated horny layer, which also fills up the depressions between the papillæ. Between the cornified epidermal layers are found dried masses of exudation, with nuclei that are partially stained, and heaps of granular detritus. The interpapillary prolongations are hypertrophied and extend deeply into the corium in many places. The principal pathological changes are found in the upper layers of the corium, in the papillæ and adjoining layers, which are filled with foci of closely aggregated cells. These foci consist of a granulation tissue made up of round cells at the periphery, large epithelioid and Langhans cells toward the centre, while the centre itself in the majority of cases is formed of a necrotic mass, indistinctly defined at its border. In a word, the histological appearances of tubercle are well defined. Besides these tubercles, foci of suppuration are also found at the points where the epidermis has penetrated most deeply, which finally break through the overlying tissue and form small crypts filled with horny masses from the continued growth of the epidermis. The tubercle bacillus was constantly found in the nodules of granulation tissue. On the average, more bacilli were found than in lupus, but less than in the miliary cutaneous form. Micrococci were found in all the parts where there was an acute inflammation and suppuration.

These observations of Riehl and Paltauf have been verified by the most competent observers. The limits of their original description have been enlarged, in that these wart-like patches have been shown to occur

not only in adults who have had to do with animals and animal products, but in children and in people who have been exposed to direct infection from tuberculous excretions. The only question that can arise is as to the propriety of separating these cases from lupus verrucosus, a form which they often resemble very much both clinically and anatomically.

My interest in this form was excited some years ago and my conclusions are drawn from a considerable number of examinations of lesions, or portions of lesions, removed by the cutaneous punch and hardened and stained in various ways.

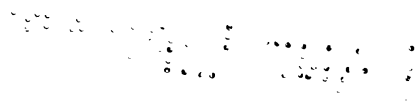
The occurrence of foci of acute inflammation immediately below the rete, and the formation of miliary abscesses was emphasized by Riehl and Paltauf as one of the characteristics of this as distinguished from other forms of cutaneous tuberculosis, but was regarded as a secondary phenomenon and due to an invasion of the tissues by colonies of micrococci. In the more typical lesions, those first described by these authors as occurring upon the hands of adult butchers, cooks, etc., as well as in the anatomical wart, these inflammatory complications are indeed most marked. In many papillary growths, however, that undoubtedly belong to this class, this secondary inflammation is very slight or totally wanting, as was verified in a number of lesions that exhibited microscopically the histological appearances of tuberculosis and contained the tubercle bacillus. It may be fairly said, I think, that these inflammatory appearances are frequently found engrafted upon a tuberculosis verrucosa cutis, but their occurrence, in my experience, is not sufficiently constant to render their absence a point of consequence, and in any case they are secondary phenomena. They have not been present to any extent in the cases that I have examined occurring in children upon the hands, elbows,

knees, etc., in the form described many years ago by Dr. McCall Anderson, under the title of lupus or scrofuloderma verrucosum. The histological appearances here give us a picture of nests of epithelioid and Langhans giant cells in the upper layers of the corium, with a papillary hypertrophy and an increase of cornified epithelium. Nor were these inflammatory appearances present in several cases of verrucous tuberculosis upon the bodies of people suffering from lesions of scrofuloderma or lupus of other parts. They seem to occur most frequently in the cases that present clinically the features of a typical verruca necrogenica.

With regard to the numbers of bacilli found, I have not been so fortunate as the writers quoted. While the detection of the specific micro-organism has been a comparatively easy matter in some instances, in others it has required a long and laborious search, equal to that demanded for their detection in lupus; and so far as my own researches go, I have not been able to demonstrate a striking divergence from lupus in this regard.

The chief anatomical characteristic that tuberculosis verrucosa affords in distinction from the papillary growths of lupus, is the *situation* of the tuberculous neoplasm. While the foci of granulation tissue lie in the lower and middle portions of the corium in lupus, in tuberculosis verrucosa, they are quite constantly found in the upper papillary layers, usually in the papillæ themselves, and in this respect my experience accords quite exactly with that of Riehl and Paltauf. It must also be admitted that in the form under consideration, the papillary outgrowth occurs at a very early period, perhaps at the very beginning of the affection, while in lupus it is met with most frequently at a later period, when the tissues have become broken down and ulceration has taken place.

Anatomically, therefore, this affection differs from lupus papillaris chiefly in the superficial seat of the process. Many transitional forms may occur, and it may often be difficult to say, from a microscopical examination alone, which of the two varieties we have before us. Riehl and Paltauf have undoubtedly brought into the limits of tuberculosis certain affections that were regarded before as doubtful or classed under other headings, and their work must be regarded as a distinct addition to our knowledge of the disease. For the present, at least, tuberculosis verrucosa cutis should be accorded a separate place among the varieties of this disease. Granting that the anatomical distinctions from a verrucous lupus are often slight, we have still the fact that these lesions were not, until the microscope taught us their histology, commonly classed with tuberculosis or lupus. A further argument in my mind for separating them from lupus, lies in the fact that the clinical evidence in these cases points to their being produced by *direct* inoculation, — a mode of infection that cannot as yet be demonstrated in a large number of lupus cases.



THE THERAPEUTICS OF CUTANEOUS TUBERCULOSIS.¹

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IN discussing the treatment of tuberculous affections of the skin, it will be convenient to consider first the local measures which may be employed, and then the constitutional remedies which may prove of service in facilitating a cure. In other words, we may regard the subject first from a surgical and then from a medical point of view. I will state at the outset, that I do not propose to even enumerate the various remedies and plans of treatment which have from time to time been recommended, but will confine myself to a discussion of those which have the sanction of high authority, and those which I have personally found to be of value.

As lupus vulgaris stands foremost among tuberculous affections of the skin, and as other forms of cutaneous tuberculosis are amenable to a like treatment, we will begin with the local therapy of this disease.

All are agreed, I think, that three objects are to be aimed at in the local treatment of lupus. These are (1) the removal of the morbid tissue, (2) with as little pain as possible, (3) with the least resulting disfigurement. A brief consideration of various methods in vogue will perhaps show how they fulfil these respective indications.

The oldest remedy in the treatment of lupus and one still recommended by some surgeons, is the knife.

¹ Read at the Annual Meeting of the American Dermatological Association in Washington, September, 1891, introductory to the discussion upon the treatment of Cutaneous Tuberculosis.

This will certainly remove the disease when limited in extent, and with the modern improvements in skin-grafting, a patch of lupus of almost any size might be excised and the wound healed. But this cannot be accomplished without much dread and discomfort on the part of the patient, and where a plastic operation on the face is involved, the result is seldom satisfactory from a cosmetic point of view. The prevalent fear of the surgeon's knife may be irrational, but it exists, nevertheless, and, in spite of the favorable results reported by Hahn, Senger and others, in no case of lupus, large or small, is excision, in my opinion, preferable to other methods of treatment at our command.

The cautery, as commonly employed, is another agent, which I would unhesitatingly condemn. Acting equally upon healthy and diseased tissue, it must either produce an unnecessarily deep ulcer, or else the smooth, superficial and delusive cicatrix will soon appear studded with isolated nodules. Whether a Paquelin or galvano-cautery be used the operation is generally painful and the result either uncertain or disfiguring.

Doubtless the best method of employing heat in the treatment of lupus is that advocated by Besnier, and one which I must frankly confess, I have never fairly tested. This method consists in making punctate and linear scarifications by means of variously shaped needles, knives and buttons of platinum, connected with a galvano-caustic battery. Being sceptical as to the danger of general tuberculous infection resulting from blood-letting operations, such as scraping and scarification, I have failed to appreciate the advantages claimed by Besnier for his method of treatment.

The use of the flat electrode for the destruction of lupus tissue, as endorsed by Dr. G. T. Jackson, at the

last meeting of our Association, I have tried repeatedly. There is no doubt as to the good result that can be obtained by this method, but the time required to effect the result is so great as to render the method of comparatively little value.

The curette is an instrument well deserving the high reputation it has acquired in the treatment of lupus. When used alone it is apt to prove insufficient to effect a cure. It usually removes the greater portion of the diseased tissue with ease, and when cocaine is injected or even applied on pledgets of cotton to the new surface, a large patch may be scraped with but little pain or discomfort to the patient. The healthy tissue remains uninjured, and a wound is left, which properly dressed, will heal speedily and leave a smooth cicatrix. The size and shape of the curette is largely a matter of taste, but the form of the Volkmann spoon can hardly be improved. For recurrent isolated nodules appearing in the cicatrix after a previous unsuccessful operation, and for the minute points of diseased tissue noted after multiple scarification, even the smallest curette is apt to prove too large.

Here a dental burr or a dental excavator can be used to great advantage. Indeed, whenever lupus appears in the form of disseminated nodules, burrs of varying size will be found greatly superior to a small curette. With such an instrument many small and deeply-seated nodules of lupus can be bored out which would escape the action of any scraping process. Since recommending the use of the dental burr six years ago in the *Journal of Cutaneous and Venereal Diseases*, I have used it many times and with the greatest satisfaction. Until quite recently I was unaware that Mr. Morris, of London, had previously devised a similar instrument for this purpose. This is a double-screw excavator in which the lacerating edges

are arranged around a cone in the form of two parallel spirals. It is claimed that as the pitch of each spiral considered separately is double that of the single threaded screw, the cone can be inserted to its full depth with fewer turns of the instrument, thus reducing the duration of the operation and the suffering of the patient by fully one-half. It seems to me that this advantage is wholly theoretical and that the ordinary burr obtainable from any dentist or dental instrument dealer will fully answer the purpose.

As regards scarification in the treatment of lupus, too much, I think, has been said in its favor, while the objection raised against it, that it promotes the absorption of bacilli and leads to pulmonary tuberculosis is largely hypothetical. Linear scarification, as advocated by Squire and Vidal, is certainly an improvement upon the punctiform scarification employed by Dubini, Volkmann and Veiel. There is no doubt but that it will cure lupus in most cases, and leave the most satisfactory cicatrix, but this method of treatment involves usually an amount of time and patience which greatly lessens its value as a therapeutic measure. The only cases in which it is superior to other plans of treatment are those of ulcerating lupus of the nose. Here the curette and various applications which tend to remove the diseased tissue are liable to cause considerable deformity, and cause the patient to go through life with a misshapen or stumpy nose. Scarification, however, in such cases, while it gradually destroys the lupus, permits a new growth of connective tissue to take its place, which tends to preserve the size and form of this important feature. As Vidal has shown by microscopical observation, the lupus cells gradually alter their configuration and assume the shape of fibres of connective tissue, and, as Squire has claimed, the nose may often be actually rebuilt.

Of caustics and various applications which tend to destroy lupus tissue by virtue of their chemical effect, a long list might be given. All have proved of service in certain cases; few have manifested any remarkable and distinctive therapeutic value, while none have as yet found their way into general favor. I will merely mention nitrate of silver, caustic potash, chloride of zinc, lactic acid, ethylate of sodium, iodoform and aristol, and remark that in spite of time-honored usage or eminent recommendation, they possess no special value in the treatment of lupus, and in many respects are greatly inferior to remedies of which I shall presently speak.

The use of bichloride of mercury, on account of its bacillicide properties, has been advocated by Doutrelepon, Tausini, White and others. My own experience with this method of treatment has proved unsatisfactory, and the slight improvement which took place in a few cases appears to be due rather to a stimulating effect such as would follow its application to the nodules of acne or rosacea, rather than to any parasiticide action. The reported experience of others has been similar to mine.

Of the various substances applied to ulcerating lupus and to the curetted surface, with a view to the complete destruction of the lupus tissue, no one has perhaps met with greater favor than pyrogallol. This was introduced by Jarisch, who recommended a ten per cent. ointment to be applied twice daily, after thorough curetting of the patch. At the end of three to five days, or when the surface appears swollen and of a dirty grayish hue, iodoform is to be plentifully applied, which tends to check the pain produced by the ointment. This is covered with linen smeared with boric acid ointment, and bandaged for several weeks, until the suppuration lessens and healing be-

gins. Mercurial plaster is now applied, and after four or five weeks the same cyclus of curetting, pyrogallol, iodoform with boric acid dressing is repeated in order to prevent the return of the lupus in the form of miliary infiltration. Finally, the wound can be healed rapidly by skin transplantation.

For many years I have had more satisfactory results from a somewhat similar plan of treatment than from any other method which I have employed. I have, however, used a much stronger ointment of pyrogallol, varying from twenty-five to fifty per cent., which greatly shortens the duration and adds to the efficacy of the treatment. The application is sometimes quite painful for the first twenty-four or forty-eight hours, and may give rise to considerable inflammation of the part. But the continued use of the strong ointment soon produces a benumbing sensation in the locality to which it is applied, and no further complaint of pain is made until the ointment is discontinued and a simple dressing is substituted. This application, coinciding with the separation of the sloughing tissue, will often be regarded by the patient as more painful than the pyrogallol. When the dirty, brownish, pultaceous slough has separated and left a clean, raw surface, mercurial plaster may be applied, beneath which the ulcer will become converted into a smooth, pliable cicatrix. Or, if the raw surface be considerable in extent, Thiersch's method of skin transplantation may be employed with benefit. I have no hesitation in recommending this use of (1) the curette, (2) the strong pyrogallol ointment, and (3) the mercurial plaster as a most admirable method in the treatment not only of lupus but of rodent ulcer. It is a method which has many advantages and few objectionable features.

Allylic acid is a remedy which experience has

proved to be of service in the treatment of lupus and other forms of cutaneous tuberculosis as well as in many other affections of the skin. In a letter to the *British Medical Journal* in 1884, it is recommended in the treatment of lupus vulgaris, by Dr. J. G. Marshall. In a paper published in the *London Lancet* in 1886, Unna advocates its use in most enthusiastic terms. He recommends the application of varying strength, but all containing two parts of beech tar creosote to one part of salicylic acid. The pain caused by the acid alone is very severe, and constitutes a serious objection to its use, but it is greatly mitigated by the anæsthetic action of the creosote, which Unna speaks of as the "morphine of the skin." The creosote has an antiseptic and bacillicide effect, and is therefore both corrigent and adjuvant to the salicylic acid. A strong plaster is at first applied to destroy the epidermic covering of the lupus tissue. Before the second plaster is applied to the raw surface, a solution of cocaine may be employed, which will temporarily deaden the pain, which in a short time yields to the more lasting anæsthetic effect of the creosote. The remedy leaves a smooth cicatrix, but according to Unna, redness of the scar is apt to persist for some time, owing to a paresis of the capillaries or destruction of the stratum granulosum.

I have used this combination of salicylic acid and creosote in an Irish-moss plasma, and so far with satisfactory results, but my experience will not have been sufficient to say whether or not it is of value in the treatment of lupus.

I have also used it, but one more local application, in the treatment of my lupus patients. The Skin Hospital, has produced very good results. The remedy is very beneficial. I have treated about thirty-five years.

ferred from lupus of the right ear and neck for eight years. Surgical measures had been employed by one or two dermatologists with no marked results. Injections of Koch's lymph were employed for two months or more at St. Luke's Hospital, and although the reaction was characteristic, the patient was finally discharged with no apparent improvement. He now entered my service at the Fordham branch of the Skin and Cancer Hospital, where for the past three months the fuchsine treatment has been faithfully carried out by Dr. A. C. Lewis. The surface of the affected skin or a portion of it has been very superficially scarified with a scalpel twice a week, and a one per cent. alcoholic solution of fuchsine painted over the part. The treatment has been almost painless, but nevertheless the elevated lupus tissue has completely flattened, and now only dull red patches are to be seen. The prospect of an absolute and speedy cure in this case seems quite encouraging.

The constitutional treatment of cutaneous tuberculosis may be conveniently divided into the specific and non-specific, the former aiming at a direct action upon the morbid growth, the latter merely improving the general condition of the patient and thereby modifying the soil upon which the tuberculosis is implanted.

Despite the vagueness of the term there is certainly such a thing as scrofula. It is an inherited or acquired condition of certain tissues, which leads to the development of definite and characteristic symptoms. It doubtless renders the subject of this diathesis especially liable to the engrafting of tuberculosis in the strict sense of this term. Although no one can assert that cod liver oil or iodine or the hypophosphites have ever produced the slightest direct effect upon lupus or other tuberculous lesions, there is no question as to the value of these remedies in combating the scrof-

ulous diathesis. In the therapy of cutaneous tuberculosis, these remedies may therefore be justly considered as prophylactic, and clinical observation has repeatedly shown that in certain cases they are a valuable and often indispensable adjuvant to local measures. Without discussing this subject at length, I would merely take this opportunity of expressing my firm belief in the value of iodide of starch as a reconstructive agent in all cases of struma, whether tuberculosis be present or not. In 1880, McCall Anderson advocated the use of this remedy in erythematous lupus, and strangely enough implied that it was of no value in lupus vulgaris. His formula consisted of twenty-four grains of iodine to an ounce of starch, the iodine to be triturated with a little water, and the starch to be added slowly, the mass to be dried by a gentle heat, and kept in a close-stoppered bottle. By use of this remedy, he claimed that the largest amount of iodine could be most easily introduced into the system. I have used this remedy freshly prepared, with great satisfaction, and I think with great benefit, not only in cases of lupus vulgaris, but in many cases of acne occurring in lymphatic subjects, and also in cases where chronic syphilis is combined with struma.

We come now to the specific treatment of cutaneous tuberculosis, and the method promulgated a year ago by Robert Koch, is the only one which seems worthy of discussion. As to the precise action of tuberculin in tuberculous and healthy subjects, there are many questions of greater or less scientific importance which as yet remain unsettled, but sufficient time has elapsed and sufficient experience has been acquired to enable an unprejudiced student of therapeutics to form at least an opinion, if not a definite judgment, upon this novel method of treatment.

In Europe, according to the various published reports, a most remarkable diversity of results has followed the employment of lymph injections in the treatment of tuberculosis. As geographical locality can certainly exert no influence upon the therapeutic method in question, and as men of science profess to acknowledge but one brotherhood and one Fatherland, it is simply astounding that such conflicting observations should have been made upon different sides of the Rhine. While some will explain this diversity of opinion by reference to national pride and national enmity, others may perhaps conclude from a study of the published reports, that Koch's lymph is a divine remedy for the tuberculous German, but sure death to the tuberculous Frenchman.

In this country the introduction of Koch's method has been followed by a most decided reaction. The public press, which went fairly wild over the startling novelty, would now scarcely devote a paragraph to a dispassionate statement of its value. The numerous members of the profession who thronged our public hospitals and gazed in awe at a simple hypodermic injection, or offered fabulous prices for a few drops of the lymph, are now busied with newer remedies, and would not buy the lymph if it were offered at ten cents a gallon. But this does not in the least affect the question as to whether tuberculin is or is not a remedy of practical value in the treatment of tuberculosis.

The experience of physicians in this country, where national feeling plays little or no part in determining the final judgment in the matter, ought to prove of exceptional value, and the expressed opinion of members of this Association, however various it may be, will doubtless serve to mould medical opinion on this side of the Atlantic.

My own experience in the use of tuberculin has

been limited to a few cases in my service at the New York Skin and Cancer Hospital, including lupus vulgaris, lupus erythematosus, sarcoma and leprosy, while a few more of my patients were kindly treated for me by Dr. Kinnicutt, at St. Luke's, and Dr. Bailey, at the Post-Graduate Hospital. These include cases not only of both forms of lupus, but also of eczema, epithelioma, and syphilis. I need not give detailed histories of any of these cases, but will simply speak briefly of the general results attained and conclusions formed. None of the alarming effects reported by many others occurred among my cases, probably from the fact that I limited myself to the use of small doses, injecting one milligramme, or even less, at the outset, and rarely increasing the dose above ten or fifteen milligrammes. In one very nervous patient with erythematous lupus of the cheeks, the first injection was followed by an attack of hystero-epilepsy, the patient having a series of rather severe opisthotonic convulsions during the succeeding twelve hours. That the lymph, however, was not the direct cause of these unexpected symptoms, was proven later by a series of milder convulsions which followed the injection of pure water. A somewhat remarkable subnormal temperature followed the second or third injection in a case of leprosy of the tubercular type, the house-physician asserting that the careful use of a reliable thermometer showed the figure to be 94° .

In my lupus cases, to which I shall restrict my remarks, the local and general reaction occurred in a characteristic but mild form, but with the exception of two cases, no decided curative effect was produced. In one of these, vigorous curetting had been employed a short time before, and the cheek presented a group of pinkish nodules which were largely cicatricial in character. Reaction occurred after the first injection.

tions and then ceased. In this case, though the patient was discharged as cured, but little if any credit could justly be awarded to the action of the lymph.

In another case, of a young woman whom I had treated for lupus of the nose, simply with the dental burr and without affecting a complete cure, a steady and decided improvement occurred from injections made at the Post-Graduate Hospital. The small nodules flattened and disappeared, leaving only a congested cicatrix, and a few suspicious points. During the past few months, however, in which I have done nothing but watch the case with interest, these suspicious points have faded, and the lupus now appears to be permanently cured. This patient might have been more speedily cured by curetting and the use of pyrogallol or salicylic acid, but a more noticeable scar would doubtless have been left.

In other cases of lupus under my care or observation, no approach to a cure occurred in spite of numerous repetitions of both local and general reaction. When reaction ceased altogether, and the lesions appeared as prominent or even more so than at the outset, it was natural to conclude that no good had been accomplished and that Koch's method, in these cases at least, had proved a failure. I wish to condemn such a hasty conclusion, for I believe that good results have been accomplished in some cases, although they were not apparent upon the surface. The first case of lupus injected in New York was a young woman with a patch involving the ear and a portion of the cheek. She had been treated for several months at the Skin and Cancer Hospital, with but slight improvement, and was placed in Dr. Kiuncutt's care at St. Luke's, for lymph treatment. For a month the prospects of a speedy cure were brilliant, as the reactions were typical and decided, and improvement began to mani-

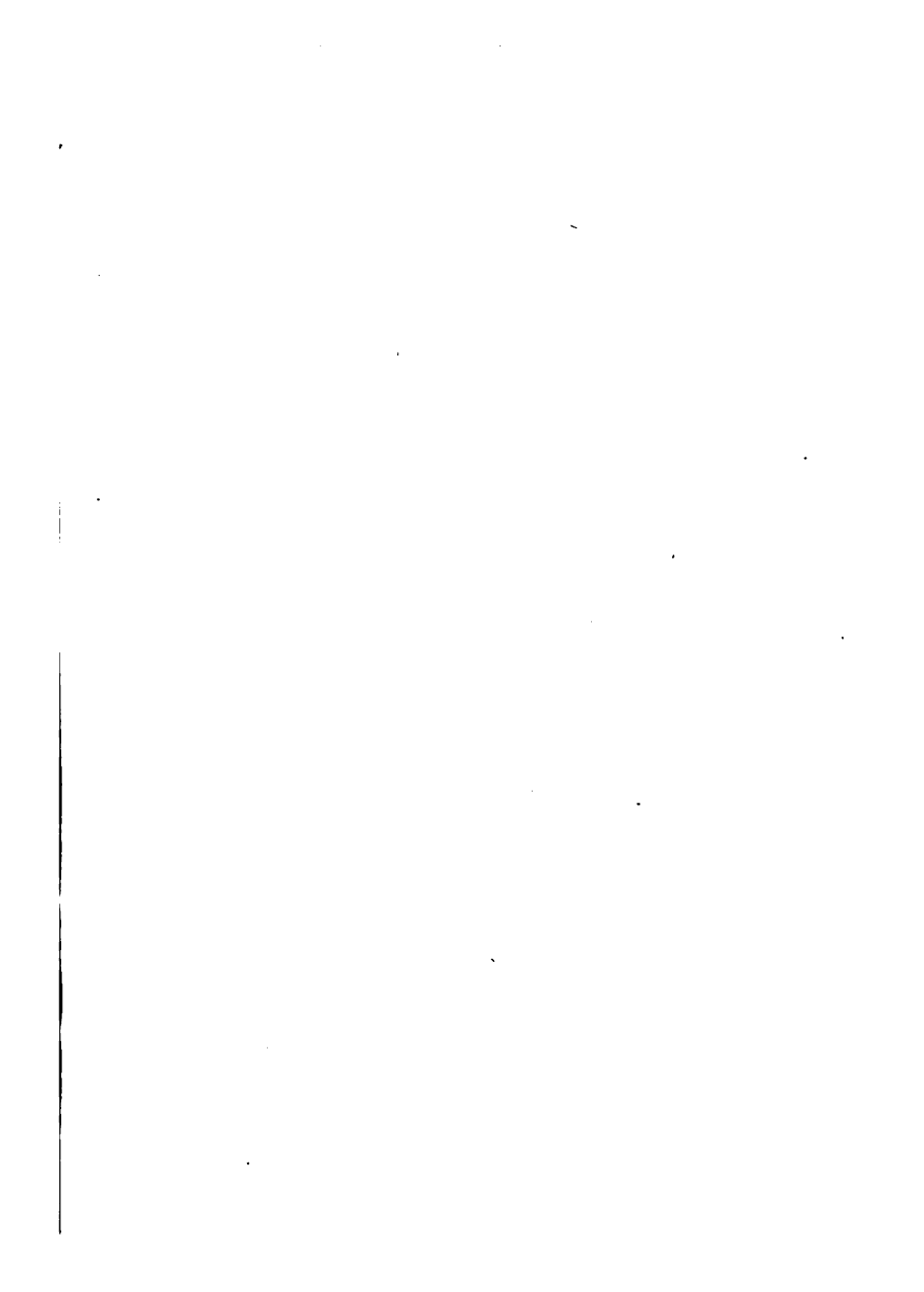
fest itself. Reaction then ceased, no further improvement occurred, hope gave way to discouragement, and after about three months the patient was sent back to me. I now resumed the previous surgical treatment with the burr, and found that the lupus tissue beneath the surface had been softened to such a degree that it could be much more readily destroyed. The patient is now about well, and although the treatment may have been a trifle more energetic than before the lymph was used, I am convinced that the present successful result is largely due to its beneficial effect.

Another case of long-standing lupus treated at St. Luke's, was finally discharged and sent to me with a note from Dr. Kinnicutt, saying that there was no reason for pursuing the treatment by injections of lymph. This is the case to which I have already referred as being nearly well under the fuchsine treatment. As fuchsine has been used in lupus without success, I am inclined to believe that the notable effect produced in this case may be due in some measure to a change in the lupus tissue produced by the injections.

In the great hospitals of Paris, Vienna and Berlin, Koch's remedy has been tested upon a more extensive scale than in this country, and observations have been made with the greatest care. In this great trial involving the question of life or death, to a large proportion of suffering humanity, it may be said that the jury has disagreed. A commission of eminent physicians of the Hôpital St. Louis, after an experience based upon the treatment of fifty cases, has reported in terms of unqualified condemnation. Kaposi, in Vienna, after an experience in fifty cases (thirty-five of which were lupus vulgaris), reports that many unpleasant general effects were produced by the injections. Though reaction occurred in non-tuberculous cases, it was not as prompt, intensive and constant as in lupus

vulgaris. In this disease the lymph worked promptly in producing a superficial, temporary inflammation, followed by a notable flattening, loss of color, and improvement within a few weeks. But no cure was effected. He asserts that the lymph will not take the place of other remedies, upon which reliance must still be placed, and adds that it remains yet to be determined in what manner and to what degree a methodic alternation and combination of Koch's method with those previously employed, may prove advantageous in the therapy of lupus. Neumann states that in the majority of cases repeated injections exert a specific action upon lupus tissue, obtained by no other method of treatment heretofore employed, and the use of the lymph in certain cases of lupus produces an improvement, and in many localities effects a cure. He adds that from henceforth no specialist will fail to test tuberculin before resorting to the old methods of cauterizing and scraping, and claims that with no other method has he succeeded in four months in effecting such an improvement in certain cases as has resulted from the lymph injections. In the official report of the Prussian Universities on the action of Koch's remedy for tuberculosis, favorable reports are received from the dermatological clinics. Doutrelepon, of Bonn, says: "Our observations fully confirm the statements of Koch. . . . Our lupus cases all heal under the use of Koch's remedy. . . . The treatment of tuberculosis by Koch's lymph is to be considered as one surpassing all previous methods, both as to the length of treatment and the beauty of the resulting scars."

When doctors disagree, who shall decide? In default of a unanimous verdict from such authoritative sources as have been mentioned, it remains for each to test Koch's remedy for himself, and to arrive at an independent conclusion.





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